

NOTES ON *CALOTES VERSICOLOR* (DAUDIN) JERDON.

BY

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(With 3 plates).

The BLOODSUCKER is so common an inhabitant of almost every garden in India, that it is frequently referred to as the 'garden lizard'. How it ever came by the name of Bloodsucker is difficult to say, for it could not 'suck' even if it would; and the choice of this name is certainly more unfortunate than that of 'chameleon' which is commonly used for this lizard by the Europeans in Indo-China. This *Calotes* is not the Chameleon, but it is rightfully entitled to its specific designation *versicolor* or 'colour-changing', because it can change its colour to some extent under ordinary circumstances, and does change it very much during the breeding season.

As a rule the Bloodsucker, either male or female, is by no means conspicuous. Not that it remains in hiding, for it takes keen delight in warmth and light and may be seen in the open basking in the morning sun, on the alert for some unwary prey. Light brown or greyish, with or without a greenish tinge and indistinct dark spots or streaks, its colour easily blends with the varied hues of the surroundings, while the general outline and the peculiar favourite attitude assumed when at rest further contribute to render the animal invisible to all but experienced eyes.

During the cold season bloodsuckers seek shelter in hollow trunks or holes in the ground, or enter houses where they hide behind furniture and curtains. They only emerge from their retreat during the hottest part of the day to bask in the sun and indulge in short spell of exercise. As the weather becomes genial and warmer they come out more often, until finally they settle down for good in the open where they spend the summer months.

The breeding season is heralded by a remarkable change of colour. While the female is satisfied with a slight maidenly blush, the male dons the most extraordinary polychromous attire, the head, the shoulders, a portion behind the shoulders, and a part of the forelegs become brilliant crimson or bright scarlet; black patches appear on either side of the throat, at the angle of the jaw, and the shoulder.

Thus grotesquely, some say gorgeously, painted the male sits on a fence post or on the trunk of a tree surveying the neighbourhood. By now its manners are as loud as its dress, and its sole intent is to seek a quarrel. It will from time to time distend its gular membrane and jerk its head and shoulders up and down, as an acrobat practising the 'dunds' by way of exercise. But this is not a mere physical exercise, it is to all intents and purposes a provocation, a challenge to all the males

in the vicinity. And as every male is now urged by the same pugnacious spirit many fights take place with much 'all-in' wrestling and biting.

Two males about to fight will first charge each other from a distance as did the warriors of old. They then gradually approach and finally rush at one another for the grip. On meeting, both stand on the hind legs and tail, hold each other with the forelegs and endeavour to bite. Toes or a portion of the tail are often bitten off in the encounter; and a number of scratches and wounds on various parts of the body certify to the vigour of the combat. However, even with lizards, there is such a thing as shamming; and, very often the fight stops abruptly as one of the duellists believes that flight is safer than fury and runs away before much damage has been done. The victor asserts his territorial rights and becomes the uncontested monarch of all he surveys.

Sexual variation:—Except for the remarkable difference of colour during the breeding season this lizard exhibits little sexual variation. It may, however, be noted that the adult male is appreciably larger than the female, that in the adult male the base of the tail is markedly swollen, and that owing to the presence of larger muscles the lower jaw of the male forms a characteristic curve while that of the female runs in an almost straight line.

Sexual activity:—The breeding season starts in April and ends in September. Mating is frequent from the second half of April to the end of June and the early part of July.

[Annandale (1900) has given an account of the courtship of this lizard. He says that 'The males are very pugnacious and change colour as they fight. At the time of courtship a curious performance is gone through by the male, the female remaining concealed in the foliage hard by. He chooses some convenient and conspicuous station and advances slowly towards the female. His colour then is pale yellowish flesh-colour, with a conspicuous dark spot on the gular pouch, which is extended to its utmost. He stands upright, raising the fore-part of the body as high as possible and nodding his head solemnly up and down. As he does so, the mouth is rapidly and repeatedly opened and shut. When he is driven away, caught or killed, the dark spot disappears entirely from the neck. If one male is captured another takes his place in a few hours.' [*F.B.I. (Reptilia)*, 2nd. ed., p. 192.]

Dr. Annandale's mention of the total disappearance of the dark spot on the gular pouch needs explanation. There are two such black spots, one on either side of the neck; they are usually clearly defined, and particularly so during the breeding season. When the gular pouch is distended these spots are very conspicuous, often showing a narrow white ring around; but, and this is the point to be emphasized, on contraction of the pouch—as is the case with fear and death—they disappear into the folds of the neck and become invisible. This is evidently what Dr. Annandale meant; for he must have been aware of the existence of pigmented

cells and of the persistence of the pigment, even after death. As a matter of fact the old spirit specimens found in the collections of the Bombay Natural History Society still show the spots.

As for the bowings and noddings of the head they may be observed at all times and can be produced by other emotions as well as by sexual excitement. If disturbed, bloodsuckers will bow and nod their heads exactly as when courting. Personally I believe it is a threatening attitude which serves the animal for purposes both offensive and defensive. On the other hand Father Caius is of the opinion that this bowing and nodding is primarily due to the peculiar anatomical structure of the fore-limbs which makes it impossible for the lizard to erect its head and the fore-part of its body for any length of time.

Pairing takes place either on the ground or on the vertical trunk of some tree. At the time of mating the male grips the female with his jaws by the ridge at the back of her neck and, while tightening his embrace, shoots his tail and the posterior end of his body under her. Within a second copulation is over and the animals have separated.

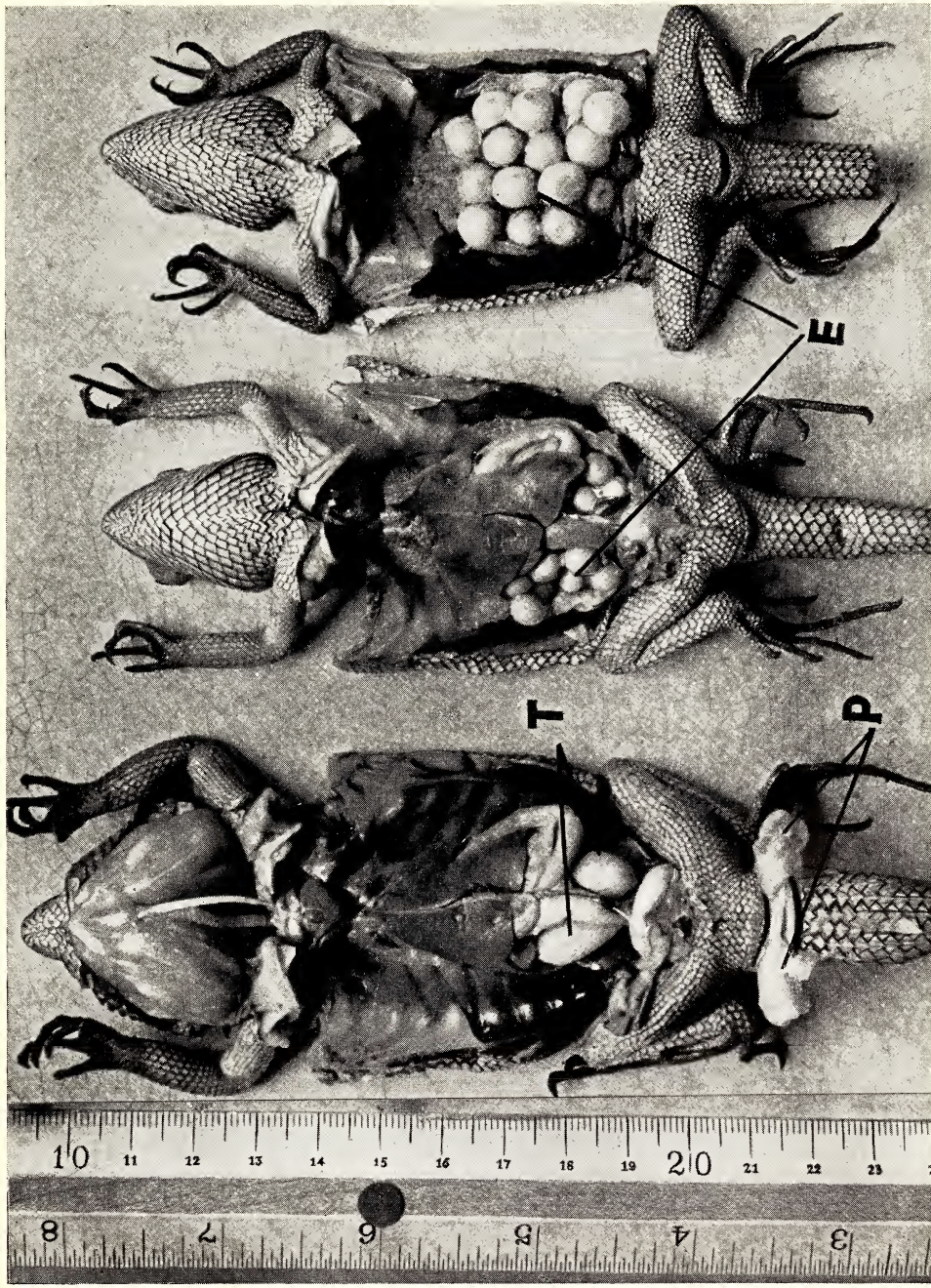
I am indebted to Mr. Sālim Ali for the following account of a pairing which occurred at Kihim on the 12th June 1930.—‘After copulation the male ran off some distance and climbed half way up a post; while the female crawled away slowly in aimless fashion, her gait being strikingly similar to that of a walking chameleon. She retained her colour (bright orange-red with two blue-black patches under the neck where the fore-limbs join the body). Not so the male who turned quite pale and only retained the blue-black patches, though in a very much attenuated hue. The female kept crawling about for some twenty minutes, when she was seen to put her nose to the ground as if scenting, and then scratching the earth with only one forepaw at a time. As she was thus engaged the male popped up from behind a stone near by; he was still pale, but as he closed upon her his colours became gradually more vivid and were again quite intense by the time he grabbed her by the neck. She now dragged him to the trunk of a neighbouring mango tree and pulled him up some two feet above the ground, when she surrendered for the second time. After separating the pair remained on the trunk, a few inches apart; the male almost colourless, the female as bright as ever. In another twenty minutes the animals copulated for the third time; the male, completely colourless by now, ran some way up the tree; and the female climbed down to the ground, crawled about for a bit—when she again put her nose down and halted at the place where she had previously pawed, and finally ran half-way up the pole where the male had taken up his position after the first act.’

Egg-laying:—In gardens, the favourite sites for the deposition of eggs are flower beds, flower pots and manure heaps, where the earth is easily scratched out. Away from gardens, any spot where the earth is soft is selected as a suitable site. The ‘nest’ may be just a trough or a hole from 2 to 7 inches deep, though shallow holes are more frequently selected. When laid in a trough, the

eggs are loosely packed; but if in a hole, they are tightly rammed, and this often results in the alteration of their shape. I have repeatedly unearthed eggs, but have never seen actual deposition in progress. However, my neighbour, Mrs. C. Mason, who witnessed a Bloodsucker laying her eggs, described it as follows: 'The lizard came down from the garden wall, went straight to a flower bed, scooped a hole in the earth 3-4 inches deep with her forelegs. She then sat on the edge of the scoop and dropped the eggs in one by one. After a few eggs had been laid, I went closer to watch the proceedings, but the lizard took fright and ran away leaving the eggs uncovered. I counted six eggs and withdrew to a point from which I could observe without being seen. Soon, the lizard returned and completed her egg-laying. When she had finished, she covered over the eggs with earth, smoothed the surface out so as to defy detection and went away. The time taken by the lizard was two hours (including the disturbance)—from 12.30 to 2.30 p.m.' Mrs. Mason marked the spot with a stone and told me about the occurrence the same evening. A week later I dug up the spot only to find the shells left, as ants had eaten the contents. The incident referred to above occurred on the 23rd July (1937). Prior to this, I found 17 eggs in almost the identical spot, on the 24th June.

Eggs:—The eggs are small ellipsoid bodies with a soft chalky white shell. They are not stuck together as is often the case with reptile eggs. When freshly taken from the 'nest' the shape may vary somewhat from the ellipsoid but this is due to pressure as they are frequently tightly packed, but when allowed to stand for a while they become elliptic once more. Eggs from different clutches vary considerably in size but those of the same clutch are fairly regular. On the 22nd August (1937), I dug out two clutches, one of 21 eggs and another of 18. The average measurements of the former were 16.8×12.6 mm. (largest 19×13 mm., smallest 15×12 mm.), and of the latter, 12.4×8.3 mm. (largest 13.5×9 mm., smallest 11.5×9 mm.). These measurements are not in accordance with those recorded by Asana ($10-11 \times 5.4$ mm.) nor with those mentioned by Dr. Malcolm Smith in the *F.B.I., Reptilia*, 2nd. ed., vol. ii, p. 193 ($14-15$ mm. long by 8-9 mm. broad). However, this only shows the great variation in size and I am in full agreement with Dr. Smith's remark 'the age and size of the parent are important factors in egg-production'. Eggs kept under observation increased 2-3 mm. in size just before the young hatched out. Eggs on being placed in preservatives shrink considerably.

Again, with regard to the number of eggs deposited at a time there seems to be a conflict of opinion. The largest number of eggs I have found in a clutch is 23. Above I referred to two clutches, one of 21 and the other of 18. On the 23rd August (1937) I obtained another clutch of 14 in my garden and a couple of days later a clutch of 15. So far I have never come on a clutch of less than 8. Dr. Smith (*loc. cit*) writes 'I have never known them to be buried more than a couple of inches below the earth, and the number deposited may vary from 4 to 12.' I am



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The Bloodsucker (*Calotes versicolor*). Dissections showing condition of the reproductive organs in June. E, eggs; P, hemipenis, T, testes. (Scale in millimetres and inches).

Photo 1



Photo :

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The Bloodsucker (*Calotes versicolor*) showing eggs:—hatching and newly hatched. (Scale in millimetres).